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ANALYSIS OF SOME NEW ELECTRONIC TRANSITIONS OBSERVED USING INTRACAVITY LASER SPECTROSCOPY (ILS): POSSIBLE IDENTIFICATION OF HCuN

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Four new electronic transitions with blue-degraded bandheads were observed in the orange-red region of the visible spectrum. The transitions were observed in the plasma discharge of a hollow copper cathode placed within the cavity of a tunable dye laser system, allowing molecular absorbance to be enhanced upon laser amplification. To produce the molecules, the surface of the copper cathode was soaked in a dilute ammonia solution prior to installation, and 1 torr of H_2 was used as the sputter gas in the dc plasma discharge. The bandheads were observed at 16,560 cm^{-1}, 16,485 cm^{-1}, 16,027 cm^{-1}, and 15,960 cm^{-1}. Using 1.5 torr of D_2 as the sputter gas resulted in a -3 cm^{-1}shift in origin for the bands in the 16,000 cm^{-1}region. Four rotational branches have been identified in each transition, and the transitions have been fit to independent $^2\Sigma$ - $^2\Pi$ transitions using PGOPHER, with spin-orbit splittings in the Hund's case (a) Π-states of -71.2 $cm^{-1}$and -65.4 cm^{-1}. The transitions have tentatively been assigned to HCuN. Results of this analysis will be presented.